

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
9 September 2005 (09.09.2005)

PCT

(10) International Publication Number  
**WO 2005/082057 A2**

(51) International Patent Classification: Not classified

(74) Agents: YIM, Peter, J. et al.; Morrison & Foerster LLP,  
425 Market Street, San Francisco, CA 94105-2482 (US).

(21) International Application Number:  
PCT/US2005/006142

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 23 February 2005 (23.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/546,848 23 February 2004 (23.02.2004) US  
60/551,632 7 March 2004 (07.03.2004) US

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (*for all designated States except US*): ACM  
RESEARCH, INC. [US/US]; 46520 Fremont Boulevard,  
Suite 610, Fremont, CA 94538 (US).

(72) Inventors; and

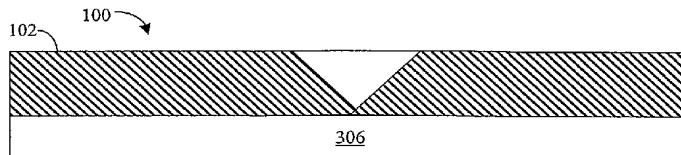
(75) Inventors/Applicants (*for US only*): WANG, Hui  
[US/US]; 340 Jacaranda Drive, Fremont, CA 94539 (US).  
AFNAN, Muhammed [US/US]; 1048 Vuelta Olives,  
Fremont, CA 94539 (US). WANG, Jian [CN/US]; 39960  
Las Palmas Court, Fremont, CA 94539 (US). GUTMAN,  
Felix [US/US]; 5237 Mill Creek Lane, San Jose, CA  
95136 (US). HO, Frederick [US/US]; 5999 Sorrel Av-  
enue, San Jose, CA 95123 (US). CHOKSHI, Himanshu,  
J. [US/US]; 38642 Pickering Court, Fremont, CA 94536  
(US).

Published:

— without international search report and to be republished  
upon receipt of that report

*For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.*

(54) Title: CONTROLLING REMOVAL RATE UNIFORMITY OF AN ELECTROPOLISHING PROCESS IN INTEGRATED  
CIRCUIT FABRICATION



(57) Abstract: A metal layer formed on a wafer, the wafer having a center portion and an edge portion, is electropolished by aligning a nozzle and the wafer to position the nozzle adjacent to the center portion of the wafer. The wafer is rotated. As the wafer is rotated, a stream of electrolyte is applied from the nozzle onto a portion of the metal layer adjacent to the center portion of the wafer to begin to electropolish the portion of the metal layer with a triangular polishing profile to initially expose an underlying layer underneath the metal layer at a point.



WO 2005/082057 A2